MALIQUA: A NEW GENUS OF BAETIDAE (EPHEMEROPTERA) FOR A SPECIES PREVIOUSLY ASSIGNED TO *AFROPTILUM*[1, 2]

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ABSTRACT: *Maliqua* (Ephemeroptera: Baetidae), n. gen., is erected for *M. plumosa*, n. comb., a West African species previously assigned to the *dimorphicum* group of *Afroptilum*. Larvae of *Maliqua* are distinguished by possessing minute denticles on the tarsal claws. Adults are distinguished by having segment 2 of the male genital forceps medially expanded at base and setose. *Maliqua* is hypothesized to be closely related to *Cloeodes* on the basis of mouthpart and male genitalic similarities.

Gillies (1990) erected the genus *Afroptilum* (Ephemeroptera: Baetidae) to accommodate all African species previously assigned *to Centroptilum* Eaton. As such, the genus included 30 species in two subgenera, *Afroptilum* s.s. and *Afroptiloides* Gillies. Gillies (1990) further subdivided *Afroptilum* s.s. into informal groupings he called the *dimorphicum*, *sudafricanum*, *sudanense*, and *tarsale* species groups, but he did not provide any phylogenetic rationales for those subdivisions. Wuillot and Gillies (1993) later described four additional species of *Afroptilum* that they variously assigned to the *tarsale* and *dimorphicum* groups.

More recently, species ascribed to *Afroptilum* have been the subject of considerable revisionary work. Wuillot and Gillies (1994) erected the genus *Dicentroptilum* for two distinct species previously considered in the *sudafricanum* group. McCafferty and de Moor (1995) synonymized the subgenus *Afroptiloides* with *Acanthiops* Waltz and McCafferty, and Barber-James and McCafferty (1997) elaborated the rationale for that revision. Lugo-Ortiz and McCafferty (1996a,b,c) erected the genera *Bugilliesia*, *Crassabwa*, and *Dabulamanzia* for most species in the *tarsale* and *sudanense* groups, and Lugo-Ortiz and McCafferty (1997a) demonstrated that two species assigned to the *dimorphicum* group are referable to *Cheleocloeon* Wuillot and Gillies. McCafferty et al. (1997) erected the genus *Micksiops* for a species previously assigned to the subgenus *Afroptiloides*.

In this paper we erect a new genus for *A. plumosum* Wuillot, a West African species originally assigned to the *dimorphicum* group of *Afroptilum* (Wuillot and Gillies 1993). We describe the new genus, hypothesize that it is closely related to *Cloeodes* Traver, and provide guidelines to differentiate the two gen-

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era. Our attempts to secure original material from Paris for examination were not successful; however, because the new genus is so distinctive and involves one of only a few unresolved species that were previously placed in *Afroptilum*, it is judicious to describe it at this time.

Maliqua Lugo-Ortiz and McCafferty, NEW GENUS

Larva. Head: Labrum (Fig. 1) anteriorly broadly rounded, with deep anteromedial notch. Left mandible (Fig. 2) with incisors fused; prostheca relatively robust, apically denticulate; small tuft of setae between prostheca and mola. Right mandible (Fig. 3) with two broadly based sets of incisors; prostheca somewhat slender, apically with sharp denticles. Maxillae (Fig. 4) relatively robust; palps two segmented, slender, not reaching galealaciniae. Labium (Fig. 5) with glossae and paraglossae subequal in length and width; palps three segmented; palp segment 1 slightly longer than segments 2 and 3 combined; palp segments 2 and 3 subequal in length and width; palp segment 3 apically rounded. Thorax: Hindwingpads absent. Legs (Fig. 6) with femora without villopore and with subparallel dorsal and ventral margins; tarsal claws (Fig. 7) with one row of minute subapical denticles. Abdomen: Gills (Figs. 8, 9) on abdominal segments 1-7, platelike, asymmetrical, anteriorly serrate. Median caudal filament well developed, with abundant short, fine, simple setae on both margins; cerci with abundant long, fine, simple setae medially and short, stout, simple setae laterally every fourth segment.

Adult. Thorax: Forewings (Fig. 10) with single marginal intercalaries. Hindwings absent. Abdomen: Male genital forceps (Fig. 11) three segmented; segment 1 short, subcylindrical; segment 2 medially expanded at base, with short, fine simple setae medially; segment 3 short, ovoid.

Type species. *Maliqua plumosa* (Wuillot), new combination.

Included species –

Maliqua plumosa (Wuillot), new combination.

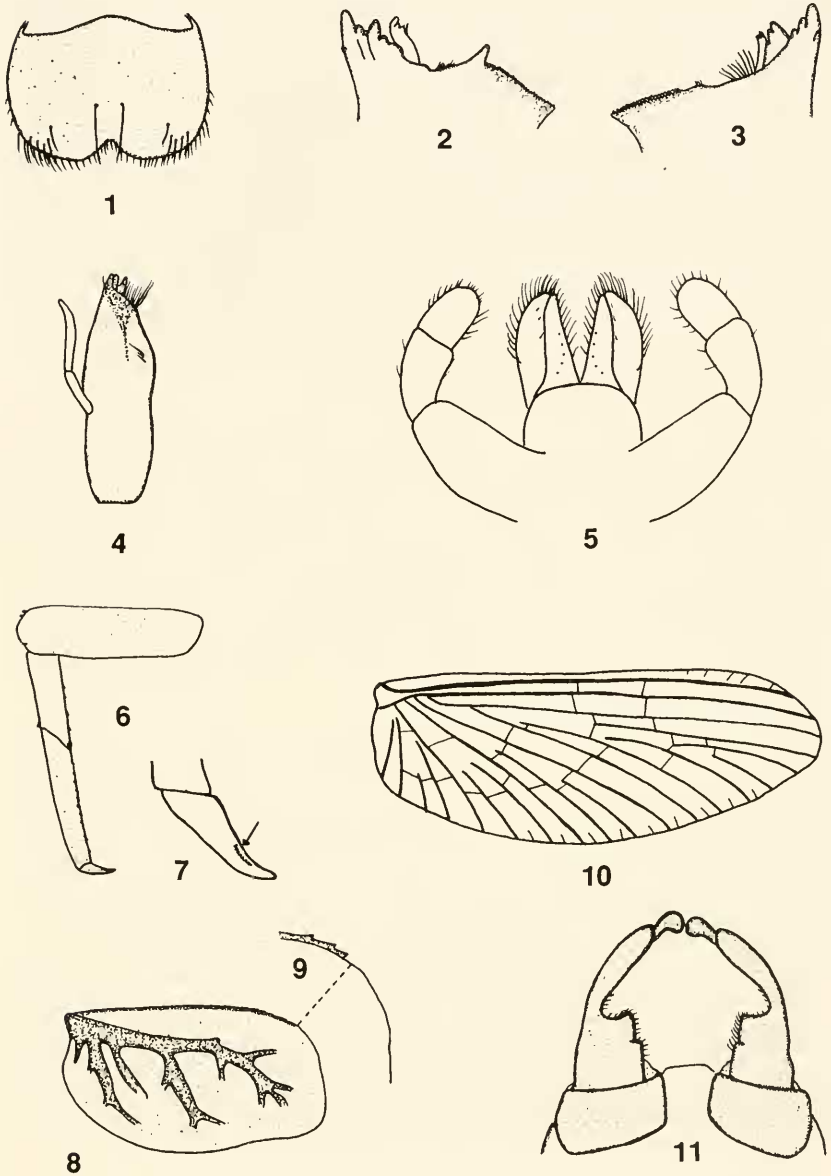
Afroptilum plumosum Wuillot, in Wuillot and Gillies 1993:276. (larva, male adult).

Distribution. Guinea, Mali.

Etymology. The generic name is an arbitrary combination of letters that incorporates the name of the country where the type locality of the type species is located. The gender is feminine.

DISCUSSION

Larvae of *Maliqua* are generally similar to those of the Pantropical genus *Cloeodes*, but are distinguished from that genus by the presence of tufts of setae between the prosthecae and molae of both mandibles (Figs. 2, 3) and minute denticles on the tarsal claws (Fig. 7). Adults of *Maliqua* are also similar to those of *Cloeodes*, but segment 2 of the male genital forceps of *Maliqua* (Fig. 11) is considerably more expanded than in *Cloeodes*. Other differences that aid in distinguishing larvae of *Maliqua* from those of *Cloeodes* are the presence in larvae of the latter genus of subproximal arcs of long, fine, simple setae on the tibiae [Waltz and McCafferty (1987b): Figs. 1, 7], edentate tarsal claws [Waltz and McCafferty (1987b): Fig. 8], and tufts of long, fine, simple setae on abdominal sterna 2-6 [Waltz and McCafferty (1987a): Fig. 5; Waltz and McCafferty (1987b): Figs. 9, 44]. The tendency of some female adults of



Figs. 1-11. *Maliqua plumosa* (Wuillot), larva and male adult [modified from Wuillot and Gillies (1993)]. 1. Labrum (dorsal). 2. Left mandible. 3. Right mandible. 4. Right maxilla. 5. Labium (ventral). 6. Right foreleg. 7. Tarsal claw (pointer to row of denticles). 8. Gill 5. 9. Detail of gill 5. 10. Forewing. 11. Male genitalia.

Cloeodes to have single marginal intercalary veins in the forewings [Waltz and McCafferty (1987a): Fig. 1; Waltz and McCafferty (1987b): Figs. 16, 18, 19, 22, 33] is also noteworthy.

Maliqua plumosa cannot be considered to belong to *Afroptilum* because it differs considerably from *A. sudafricanum* (Lestage), the type species of *Afroptilum.* Moreover, the shape of the claws and presence of a single row of denticles on the larval tarsal claws of *Maliqua* excludes it from consideration in a complex of African and Malagasy genera to which Afroptilum belongs and that also includes *Acanthiops, Centroptiloides* Lestage, *Dicentroptilum, Edmulmeatus* Lugo Ortiz and McCafferty, *Nesoptiloides* Demoulin, and *Thraulobaetodes* Elouard and Hideux (Lugo-Ortiz and McCafferty 1997b). That complex is characterized, in part, by the distinctive shape of the claws and presence of two subparallel rows of denticles on the larval tarsal claws [Lugo-Ortiz and McCafferty (1997b): Fig. 12].

The larval mouthparts are remarkably similar in *Maliqua* and *Cloeodes,* particularly with respect to the relatively robust maxillae and their somewhat short and slender palps [Fig. 4; Waltz and McCafferty 1987b: Figs. 5, 28] and the labial palps having segments 2 and 3 subequal in length and width [Fig. 5; Waltz and McCafferty 1987b: Figs. 6, 29]. Those larval similarities, plus the fundamentally similar medially expanded and setose segment 2 of the male genital forceps [Fig. 11; Waltz and McCafferty 1987b: Fig. 34], support the hypothesis that the two genera are closely related. It is possible that other apomorphies tie *Maliqua* and *Cloeodes,* but because the original description of *M. plumosa* by Wuillot and Gillies (1993) is rather brief, they cannot be ascertained at this moment.

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Further research pointed to strong asynchrony in egg hatching among populations, but synchrony with the flowering of the hostplants. The brief mating periods, in which females mate only once with one of the short-lived males are sufficiently asynchronous to preclude mixed matings. Furthermore, it is now known that males have distinctive courtship "songs," to which only females from the same host respond. Other experiments showed that eggs laid on hosts other than the females' own have nearly nil survival and reproduction. They also showed a most interesting fact: eggs on the "wrong" host hatched at the time eggs of populations adapted to that host hatched, not at the time they would have on the "correct" host. It turned out that egg hatch is controlled by the plant's spring sapflow, which rehydrates the eggs after winter dissication.

Tom now asked, could a shift to a new hostplant, coupled with asynchronous egg hatch and the short mating period, lead to host race formation and eventual speciation? Preliminary trials suggested it could, so he has now established a large outdoor experiment, involving twenty-eight, 28' x 8' x 8' cages. In these, *Enchenopa binotata* (he is getting ready to name the host races as new species) are confined on mixed and unmixed pairs of four species of *Viburnum.* He and his students, after tens of thousands of individual transplantings of nymphs, have documented non-random mating and oviposition among the populations. This success has finally persuaded NSF to support the effort. The possibility of sympatric speciation by host shift remains controversial, despite the extensive studies of cases such as *Rhagoletis pomonella,* and his research may do a lot to clear matters up. Tom says he looks forward to thirty more years of study of this fascinating beast.

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